**Faciliation of Mandarin tone perception by visual speech in clear and degraded audio: Implications for cochlear implants** a

Cochlear implant (CI) users in tone language environments report great difficulty in perceiving lexical tone. This study investigated the augmentation of simulated cochlear implant audio by visual (facial) speech information for tone. Native speakers of Mandarin and Australian English were asked to discriminate between minimal pairs of Mandarin tones in five conditions: Auditory-Only, Auditory-Visual, CI-simulated Auditory-Only, CI-simulated Auditory-Visual, and Visual-Only (silent video). Discrimination in CI-simulated audio conditions was poor compared with normal audio, and varied according to tone pair, with tone pairs with strong non-F0 cues discriminated the most easily. The availability of visual speech information also improved discrimination in the CI-simulated audio conditions, particularly on tone pairs with strong durational cues. In the silent Visual-Only condition, both Mandarin and Australian English speakers discriminated tones above chance levels. Interestingly, tone-naïve listeners outperformed native listeners in the Visual-Only condition, suggesting firstly that visual speech information for tone is available, and may in fact be under-used by normal-hearing tone language perceivers, and secondly that the perception of such information may be language-general, rather than the product of language-specific learning. This may find application in the development of methods to improve tone perception in CI users in tone language environments.